REMARKS

This Amendment and Response to Final Office Action is being submitted in response to the final Office Action mailed November 14, 2006. Claims 1-22 are pending in the Application. Claims 1, 5, and 9 are the independent claims.

Claims 1-22 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

Claims 1-22 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-2, 12-14, and 20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Juniper ("Juniper Networks M40 Internet Backbone Router Inter-Operating With the CIENA MultiWave Sentry DWDM System") in view of the admitted prior art, and Waschka, Jr. (U.S. Patent No. 4,449,247).

Claims 3-11, 15-19, and 21-22 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Juniper in view of the admitted prior art, Waschka, Jr., and in further view of Bullock et al. (U.S. Patent No. 5,764,651).

In response to these rejections, the Claims have been amended herein to further clarify the subject matter which Applicants regard as their invention, without prejudice or disclaimer to continued examination on the merits. These amendments are fully supported in the Specification, Drawings, and Claims of the Application and no new matter has been added. Based upon the amendments, reconsideration of the Application is respectfully requested, without further search, in view of the following remarks.

Rejection of Claims 1-22 Under 35 U.S.C. 112, First Paragraph:

Claims 1-22 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

Specifically, Examiner states that the determination limitation ("as determined by a performance monitor in each of the optical transmitters and each of the optical receivers in the continuous cascade of a co-located plurality of optical transmitter/receiver pairs") in Claims 1, 5 and 9 is new matter and suggests its omission.

IClaim 1 has been amended to recite, in part:

> A method . . . comprising: . . .
> monitoring a signal quality for the bit error rate test signal at each of the N optical transmitters and N optical receivers in the wavelength division multiplexed optical communication system when the measured system bit error rate is greater than the predetermined system bit error rate threshold to thereby determine which of the N optical communication channels has an associated bit error rate value that is greater/less than a specified bit error rate value, as determined by a performance monitor in each of the optical transmitters and each of the optical receivers in the continuous cascade of a co-located plurality of optical transmitter/receiver pairs, wherein each performance monitor comprises an optical-to-electrical converter, a signal conditioning unit, an analog-to-digital converter, a microprocessor, a clock and data recovery unit, a decision circuit, and an error monitoring unit, and wherein each performance monitor actively monitors bit error rate status; and
> identifying, with a diagnostics analyzer that analyzes a plurality of transmitter diagnostic output signals from each optical transmitter and a plurality of receiver diagnostic output signals from each optical receiver, which of the N optical communication channels has an associated bit error rate value that is greater than a specified bit error rate value, and thus is a faulty communication channel that needs correction~~, as determined by a performance monitor in each of the optical transmitters and each of the optical receivers in the continuous cascade of a co-located plurality of optical transmitter/receiver pairs~~ . . .

Similar amendments have been made to Claims 5 and 9, the other two independent claims. Thus, the role of the performance monitor has been more clearly captured.

Therefore, Applicants submit that the rejection of Claims 1-22 under 35 U.S.C. 112, first paragraph, has now been overcome and respectfully request that this rejection be withdrawn.

Rejection of Claims 1-22 Under 35 U.S.C. 112, Second Paragraph:

Claims 1-22 stand rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As discussed immediately above, Claims 1, 5, and 9, the independent claims, have each been amended such that there no longer exists "two readings of the determination limitation in the independent claims."

Therefore, Applicants submit that the rejection of Claims 1-22 under 35 U.S.C. 112, second paragraph, has now been overcome and respectfully request that this rejection be withdrawn.

Rejection of Claims 1-2, 12-14, and 20 Under 35 U.S.C. 103(a) – Juniper and Waschka, Jr.:

Claims 1-2, 12-14, and 20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Juniper ("Juniper Networks M40 Internet Backbone Router Inter-Operating With the CIENA MultiWave Sentry DWDM System") in view of the admitted prior art, and Waschka, Jr. (U.S. Patent No. 4,449,247).

Claim 1 has been amended to recite:

> A method of testing a bit error rate for each of a plurality (N) of optical communication channels, N being greater than 2, in a wavelength division multiplexed optical communication system having N optical transmitters communicating to N optical receivers via N communication channels, the N optical receivers being co-located with each other and with the N optical transmitters for testing, the method comprising:

cascading said N optical communication channels such that an electrical output of an optical receiver i for an optical communication channel i is connected to an input of an optical transmitter i + 1 for an optical communication channel i + 1, for all values of i from one to N-l, so as to form a continuous cascade of a co-located plurality of optical transmitter/receiver pairs;

supplying a bit error rate test signal from a bit error rate tester to an input for a first optical transmitter for a first optical communication channel;

supplying the bit error rate test signal from an output of optical receiver N to the bit error rate tester;

detecting errors in the bit error rate test signal received by the bit error rate tester and calculating therefrom a measured system bit error rate;

comparing the measured system bit error rate with a predetermined system bit error rate threshold;

monitoring a signal quality for the bit error rate test signal at each of the N optical transmitters and N optical receivers in the wavelength division multiplexed optical communication system when the measured system bit error rate is greater than the predetermined system bit error rate threshold to thereby determine which of the N optical communication channels has an associated bit error rate value that is greater/less than a specified bit error rate value, ***as determined by a performance monitor in each of the optical transmitters and each of the optical receivers in the continuous cascade of a co-located plurality of optical transmitter/receiver pairs, wherein each performance monitor comprises an optical-to-electrical converter, a signal conditioning unit, an analog-to-digital converter, a microprocessor, a clock and data recovery unit, a decision circuit, and an error monitoring unit, and wherein each performance monitor actively monitors bit error rate status***; and

identifying, with a diagnostics analyzer that analyzes a plurality of transmitter diagnostic output signals from each optical transmitter and a plurality of receiver diagnostic output signals from each optical receiver, which of the N optical communication channels has an associated bit error rate value that is greater than a specified bit error rate value, and thus is a faulty communication channel that needs correction, and

wherein the faulty communication channel is identified without selective interrogation and sequential testing of the optical transmitters and the optical receivers.

These amendments are fully supported in the Specification, Drawings, and Claims of the Application and no new matter has been added. As amended, the claim more specifically discloses the structure and functionality the performance monitor in each optical transmitter and each optical receiver. Claims 5 and 9 have been amended similarly.

Juniper fails to teach or suggest monitoring a signal quality for the bit error rate test signal at each of the N optical transmitters and N optical receivers in the wavelength division

multiplexed optical communication system when the measured system bit error rate is greater than the predetermined system bit error rate threshold to thereby determine which of the N optical communication channels has an associated bit error rate value that is greater/less than a specified bit error rate value, ***as determined by a performance monitor in each of the optical transmitters and each of the optical receivers in the continuous cascade of a co-located plurality of optical transmitter/receiver pairs, wherein each performance comprises an optical-to-electrical converter, a signal conditioning unit, an analog-to-digital converter, a microprocessor, a clock and data recovery unit, a decision circuit, and an error monitoring unit, and wherein each performance monitor actively monitors bit error rate status***; and identifying, with a diagnostics analyzer that analyzes a plurality of transmitter diagnostic output signals from each optical transmitter and a plurality of receiver diagnostic output signals from each optical receiver, which of the N optical communication channels has an associated bit error rate value that is greater than a specified bit error rate value, and thus is a faulty communication channel that needs correction, and ***wherein the faulty communication channel is identified without selective interrogation and sequential testing of the optical transmitters and the optical receivers***.

This deficiency of Juniper is not remedied by Waschka, Jr. Waschka, Jr. merely teaches a fault location technique to determine which station along a fiber link is faulty, in which an "***operator selectively interrogates the data/voice control units in the stations along the link***, using the alarm interrogate unit . . . in order to cause the BER test logic of the addressed station to provide a BER indication on the basis of the test sequence. In this manner, ***the location of the fault may be isolated by sequential testing of the stations along the channel.***" (Emphasis added). In other words Waschka, Jr. teaches a system in which an operator must selectively interrogate units along a fiber link and in which sequential testing is required. There are no such requirements in the present invention for monitoring and determining which optical communication channels in a WDM system may be faulty. Rather, the present invention identifies, with a diagnostics analyzer that analyzes a plurality of transmitter diagnostic output signals from each optical transmitter and a plurality of receiver diagnostic output signals from each optical receiver, which of the N optical communication channels has an associated bit error rate value that is greater than a specified bit error rate value, and thus is a faulty communication

channel that needs correction, as determined by a performance monitor in each of the optical transmitters and each of the optical receivers in the continuous cascade of a co-located plurality of optical transmitter/receiver pairs. Thus, it would not have been obvious to one of ordinary skill in the art at the time the invention was made to include the teachings of Waschka, Jr. with Juniper, nor would it be logical to include the teachings of Waschka, Jr. requiring an operator, selective interrogations on stations along a fiber link, and sequential testing of the stations along the channel.

Additionally, Juniper fails to teach or suggest internal performance monitors in each of the optical transmitters and each of the optical receivers in the continuous cascade of a co-located plurality of optical transmitter/receiver pairs, ***wherein each performance monitor actively monitors bit error rate status.***

Applicants note that while Waschka, Jr. does teach BER test logic at a station along a fiber link (col. 30-33) that is accessed only after an operator patches into the station's BER test logic by a BER tester, and wherein the test logic of each respective station "can be selectively addressed to isolate the location of the cause of the BER degradation." (Col. 19, lines 31-35), there is no on-board diagnostics circuit (performance monitor) that is actively monitoring BER on each of the optical transmitters and each of the optical receivers in the continuous cascade of a co-located plurality of optical transmitter/receiver pairs providing data to a diagnostics analyzer. Thus, it would not have been obvious to one of ordinary skill in the art at the time the invention was made to include the teachings of Waschka, Jr. with Juniper.

Therefore, Applicants submit that the rejection of Claims 1-2, 12-14, and 20 under 35 U.S.C. 103(a) as being unpatentable over Juniper ("Juniper Networks M40 Internet Backbone Router Inter-Operating With the CIENA MultiWave Sentry DWDM System"), in view of the admitted prior art, and Waschka, Jr. (U.S. Patent No. 4,449,247), has now been overcome and respectfully request that this rejection be withdrawn.

Rejection of Claims 3-11, 15-19, and 21-22 Under 35 U.S.C. 103(a) – Juniper, Waschka, Jr., and Bullock et al.:

Claims 3-11, 15-19, and 21-22 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Juniper in view of the admitted prior art, Waschka, Jr., and in further view of Bullock et al. (U.S. Patent No. 5,764,651).

The above arguments apply with equal force here.

Independent Claim 5 has been amended to recite:

> A method for performing a bit error rate test for a plurality of optical communication channels of a wavelength division optical communication system having transmitters and receivers, the transmitters being co-located with each other and with the receivers for testing, comprising:
>
> supplying a bit error rate test signal from a bit error rate tester to an input for a first optical transmitter for a first optical communication channel of said plurality of optical communication channels arranged in a continuous cascade of a co-located plurality of transmitter/receiver pairs;
>
> receiving the bit error test signal at the bit error rate tester from a final optical receiver;
>
> detecting a measured bit error rate, ***as detected by a performance monitor in each of the optical transmitters and each of the optical receivers in the continuous cascade of a co-located plurality of optical transmitter/receiver pairs, wherein each performance monitor comprises an optical-to-electrical converter, a signal conditioning unit, an analog-to-digital converter, a microprocessor, a clock and data recovery unit, a decision circuit, and an error monitoring unit, and wherein each performance monitor actively monitors bit error rate status***; and
>
> identifying, with a diagnostics analyzer that analyzes a plurality of transmitter diagnostic output signals from each optical transmitter and a plurality of receiver diagnostic output signals from each optical receiver, at least one faulty communication channel from said plurality of optical communication channels in the wavelength division optical communication system by performing a bit parity check for each transmitter/receiver pair because the measured bit error rate is greater than a predetermined system bit error rate threshold; and
>
> ***wherein the faulty communication channel is identified without selective interrogation and sequential testing of the optical transmitters and the optical receivers.***

Similarly, Claim 9 has been amended to recite:

> A system for testing optical communication channels for wavelength division multiplexed optical communication using transmitters and receivers, the transmitters being co-located with each other and the receivers for testing, comprising:
>
> a bit error rate tester to generate a bit error rate test signal, wherein the bit error rate test signal is transmitted over a plurality of optical communication channels in a wavelength division multiplexed optical communication system arranged in a continuous cascade of a co-located plurality of optical transmitter/receiver pairs;
>
> said tester determining a measured bit error rate, wherein said tester determines whether said measured bit error rate is greater than a predetermined bit error rate threshold for said plurality of optical communication channels;
>
> ***a performance monitor in each of the optical transmitters and each of the optical receivers in the continuous cascade of a co-located plurality of optical transmitter/receiver pairs, wherein each performance monitor comprises an optical-to-electrical converter, a signal conditioning unit, an analog-to-digital converter, a microprocessor, a clock and data recovery unit, a decision circuit, and an error monitoring unit, and wherein each performance monitor actively monitors bit error rate status***; and
>
> a diagnostic analyzer to analyze diagnostic output signals from said transmitters and said receivers and to identify at least one faulty communication channel from said optical transmitter/receiver pairs using a bit parity check because said measured bit error rate is greater than said predetermined bit error rate threshold; and
>
> ***wherein the faulty communication channel is identified without selective interrogation and sequential testing of the optical transmitters and the optical receivers.***

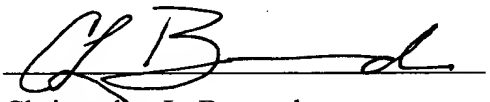
Therefore, Applicants submit that the rejection of 3-11, 15-19, and 21-22 under 35 U.S.C. 103(a) as being unpatentable over Juniper, in view of the admitted prior art, and Waschka, Jr., and in further view of Bullock et al. has now been overcome and respectfully request that this rejection be withdrawn.

CONCLUSION

Applicants would like to thank Examiner for the attention and consideration accorded the present Application. Should Examiner determine that any further action is necessary to place the Application in condition for allowance, Examiner is encouraged to contact undersigned Counsel at the telephone number, facsimile number, address, or email address provided below. It is not believed that any fees for additional claims, extensions of time, or the like are required beyond those that may otherwise be indicated in the documents accompanying this paper. However, if such additional fees are required, Examiner is encouraged to notify undersigned Counsel at Examiner's earliest convenience.

Respectfully submitted,

Date: January 11, 2007



Christopher L. Bernard
Registration No.: 48,234
Bradley D. Crose
Registration No.: 56,766
Attorneys for Applicants

CLEMENTS | WALKER
1901 Roxborough Road, Suite 300
Charlotte, North Carolina 28211 USA
Telephone: 704.366.6642
Facsimile: 704.366.9744
cbernard@worldpatents.com